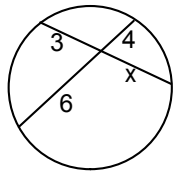
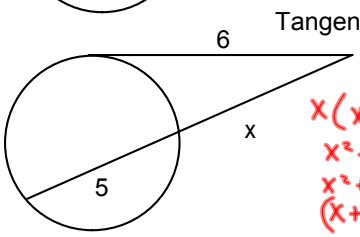
Warm-up!

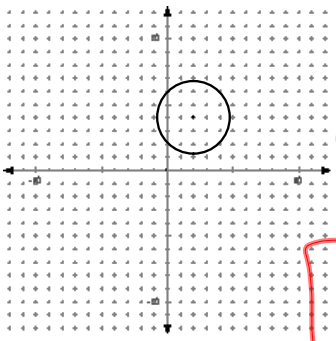


$3x = 4 \cdot 6$
$x = 8$



$x(x+5) = 6^2$
$x^2 + 5x = 36$
$x^2 + 5x - 36 = 0$
$(x+9)(x-4) = 0$
$x = -9 \quad x = 4$

10-8
Equations of Circles



Center (2,4)

$d = \sqrt{(x-2)^2 + (y-4)^2}$

$r^2 = (x-2)^2 + (y-4)^2$

$r^2 = (x-h)^2 + (y-k)^2$

$C(h,k)$

Write the equation of a circle with:
C(3, -3) and d = 12

$r^2 = (x-h)^2 + (y-k)^2$

$36 = (x-3)^2 + (y+3)^2$

Write the equation of a circle with:
C(-12, -1) and r = 8

$64 = (x+12)^2 + (y+1)^2$

Write the equation of a circle with:
Diameter endpoints(-3, -2) and (9, 4)

$r^2 = (x-h)^2 + (y-k)^2$

① Use midpoint to find Center

$M\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$ midpt

$C\left(\frac{-3+9}{2}, \frac{-2+4}{2}\right)$

$C(3,1)$ center

$r^2 = (x-3)^2 + (y-1)^2$

② Plug in a pt. to find r

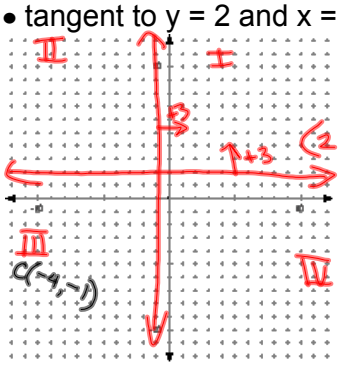
$r^2 = (9-3)^2 + (4-1)^2$

$= 36 + 9$

$r^2 = 45$

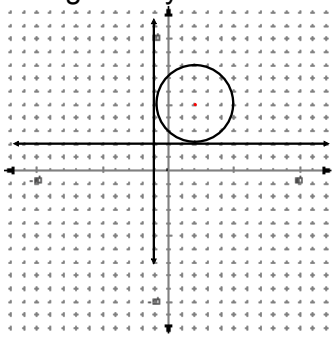
③ Write eqn. $45 = (x-3)^2 + (y-1)^2$

Write the equation of a circle with:
- Center in quadrant I
- d = 6
- tangent to y = 2 and x = -1

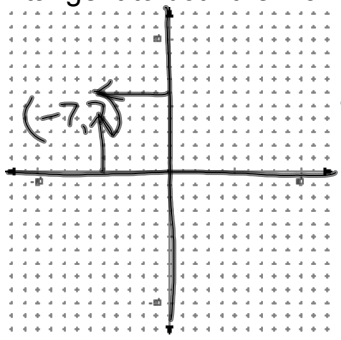


$9 = (x-2)^2 + (y-5)^2$

Write the equation of a circle with:
- Center in quadrant I
- d = 6
- tangent to y = 2 and x = -1



Write the equation of a circle with:
- Center in quadrant II
- r = 7
- tangent to both the x-axis and y-axis



$49 = (x+7)^2 + (y-7)^2$

Write the equation of a circle with:
C(4, 2) and a point on the circle (8, -1)

$r^2 = (x-4)^2 + (y-2)^2$

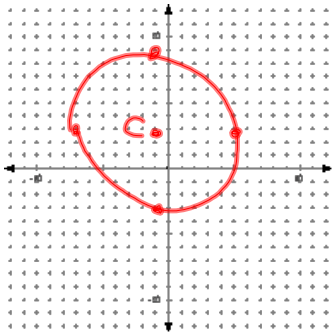
$r^2 = (8-4)^2 + (-1-2)^2$

$16 + 9$

25

$25 = (x-4)^2 + (y-2)^2$

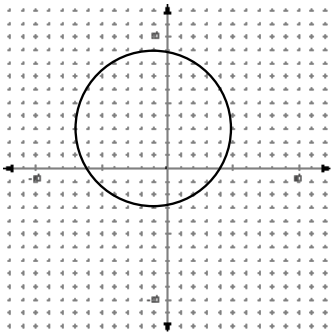
Graph the following circle:
$36 = (x + 1)^2 + (y - 3)^2$



$r = 6$

$C(-1, 3)$

Graph the following circle:
$36 = (x + 1)^2 + (y - 3)^2$



$x^2 + y^2 = 16$

What is the center?

(0,0)

What is the radius?

4

HW
p578
14, 16-20, 23, 24, 28, 32

Write an equation for each circle.

14. center at (5, 10), $r = 7$
16. center at (−8, 8), $d = 16$
17. center at (−3, −10), $d = 24$
18. a circle with center at (−3, 6) and a radius with endpoint at (0, 6)
19. a circle with a diameter that has endpoints at (2, −2) and (−2, 2)
20. a circle with a diameter that has endpoints at (−7, −2) and (−15, 6)
23. a circle with its center in quadrant I, radius of 5 units, and tangents $x = 2$ and $y = 3$

Graph each equation.

24. $x^2 + y^2 = 25$
28. $(x - 2)^2 + (y - 1)^2 = 4$

32. Find the radius of a circle with equation $(x - 2)^2 + (y - 2)^2 = r^2$ that contains the point at (2, 5).